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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,204	06/09/2005	Mi-Suen Lee	US020523	1787

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EXAMINER
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LE, BRIAN Q

ART UNIT	PAPER NUMBER
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2624

MAIL DATE	DELIVERY MODE
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12/22/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/538,204	<b>Applicant(s)</b> LEE ET AL.	
	<b>Examiner</b> BRIAN Q. LE	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-11, 13-19 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-11, 13-19 and 21-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/29/2008 has been entered.

**Response to Amendment and Arguments**

2. Applicant's arguments, see Remarks, filed 09/29/2008, with respect to the rejection(s) of claim(s) 1-3, 5-11, 13-19 and 21-23 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of US Pub. No. 2002/0159627.

***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claim(s) 1-3 and 5-8 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent<sup>1</sup> and recent Federal Circuit decisions<sup>2</sup> indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another

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<sup>1</sup> *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

<sup>2</sup> *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

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statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. Regarding claims 16 and 22, they disclose a “method/process” which does not tied to another statutory category and thus does not qualify as a statutory process. Other claims are rejected because they are depending on the independent claim 1.

### ***Specification***

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: there is no antecedent basis for the terminology “memory”. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 9-11, 13-19 and 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding independent claims 9 and 11, the terminology “memory” is indefinite since the specification does not define whether or not

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“memory” encompasses statutory tangible product such as a hard drive, ROM, RAM, etc... or a non-statutory entity such as “signal”, “carrier wave”, or “transmission medium”.

Other claims are rejected because of their dependency to the independent claims.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-3, 5-11, 13-19 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,806,898 by Toyama et al. ("Toyama") and U.S. Patent 6,707,933 by Mariani et al. ("Mariani"), and further in view of Schneiderman et al. U.S. Pub. No. 2002/0159627.

Regarding claim 1, Toyama discloses a method (figure 8) for processing an image containing at least a portion of a head of a human in a video phone system, comprising:

estimating an orientation of said head in said image using a pattern recognition technique (810);

computing a three dimensional model of a face surface of said human using a computer vision technique (822, 824); and

adjusting an orientation of said three dimensional face surface model to provide a frontal view (826).

Toyama does not explicitly disclose a pattern recognition technique comprises a classification technique and does not appear to disclose that the image is kept unmodified when the orientation of the head is estimated to be frontal, as claimed. It appears that Toyama performs the computing and adjusting steps regardless of the orientation of the head. Also, Toyama does not explicitly teach computing a three dimensional model on a face surface of said human using a computer vision technique based on the result of the classification technique.

Mariani discloses a facial direction estimation system. In particular, for a video conferencing environment, Mariani teaches that "[u]sing the face direction estimation ... it is possible to enhance the quality of the transmitted images by generating a frontal view when the face is off-frontal ... or by unchanging the current satisfying frontal face which is displayed" (column 3/34-40) and further teaches a pattern recognition technique (column 3, lines 63-65) comprises a classification technique (column 4, lines 25-28). Thus, Mariani, like Toyama, recognizes the need to adjust the orientation of the face in order to achieve eye-to-eye contact for video conferencing communications. Mariani further recognizes that when the original image of the face is a "satisfying frontal face" there is no need to change the orientation of the head, and the image can be left unchanged. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Toyama by Mariani to achieve the claimed invention since Mariani teaches that when the orientation of the head is estimated to be front-facing, there is no need to modify the image of the face since it is already in the desired orientation.

Additionally, Schneiderman teaches a facial processing system (FIG. 6) wherein discloses computing a three dimensional model on a face surface of said human using a

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computer vision technique based on the result of the classification technique (a processing of three dimensional model utilizing decision rule mathematically to train classifiers) (page 4, [0054] and page 5, column 2). Modifying Toyama's method of processing human facial according to Schneiderman would be able to compute a three dimensional model on a face surface of said human using a computer vision technique based on the result of the classification technique. This would improve processing because it would improve estimation of the presence of the 3D object based on evaluation of the plurality of visual attributes (page 2, [0014]) and therefore, it would have been obvious to one of the ordinary skill in the art to modify Toyama according to Schneiderman.

Regarding claim 2, Toyama discloses said computing step further comprises the step of using a symmetric face assumption to obtain a complete three dimensional face surface model for a profile view (824).

Regarding claim 3, Toyama discloses said computing step further comprises the step of employing a structure from motion technique to obtain said three dimensional face surface model (column 13/1-10).

Regarding claim 5, Toyama discloses said computing step generates a morphable three dimensional model (column 10/60—11/43: the 3D model of the face can be morphed, i.e., rotated, moved, changed, etc., into a desired shape/pose).

Regarding claim 6, Toyama discloses the step of mapping said three dimensional face surface model having an adjusted orientation to a two dimensional space (828).

Regarding claim 7, Toyama discloses the step of transmitting said adjusted image to a remote user (see e.g. figure 2).

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Regarding claim 8, Toyama discloses the step of presenting said adjusted image to a local user (see e.g. figures 1 and 2).

Regarding claim 9, Toyama discloses an image processor (102, figure 1) for use in a video phone system, comprising:

a memory (104) for storing an image containing at least a portion of a head of a human;  
and

a head pose corrector that

(i) estimates an orientation of said head in said image using a pattern recognition technique (810, figure 8);

(iii) computes a three dimensional model of a face surface of said human using a computer vision technique (822, 824, figure 8); and

(iv) adjusts an orientation of said three dimensional face surface model to provide a frontal view (826, figure 8).

Toyama does not appear to disclose that the image is kept unmodified when the orientation of the head is estimated to be frontal, as claimed. It appears that Toyama performs the computing and adjusting steps regardless of the orientation of the head.

Mariani discloses a facial direction estimation system. In particular, for a video conferencing environment, Mariani teaches that "[u]sing the face direction estimation ... it is possible to enhance the quality of the transmitted images by generating a frontal view when the face is off-frontal ... or by unchanging the current satisfying frontal face which is displayed" (column 3/34-40). Thus, Mariani, like Toyama, recognizes the need to adjust the orientation of the face in order to achieve eye-to-eye contact for video conferencing communications. Mariani



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further recognizes that when the original image of the face is a "satisfying frontal face" there is no need to change the orientation of the head, and the image can be left unchanged. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Toyama by Mariani to achieve the claimed invention since Mariani teaches that when the orientation of the head is estimated to be front-facing, there is no need to modify the image of the face since it is already in the desired orientation.

Regarding claim 10, Toyama discloses said head pose corrector is further configured to use a symmetric face assumption to obtain a complete three dimensional face surface model for a profile view (824, figure 8).

Regarding claim 11, Toyama discloses said head pose corrector is further configured to employ a structure from motion technique to obtain said three dimensional face surface model (column 13/1-10).

Regarding claim 13, Toyama discloses said three dimensional face surface model is a morphable three dimensional model (column 10/60—11/43: the 3D model of the face can be morphed, i.e., rotated, moved, changed, etc., into a desired shape/pose).

Regarding claim 14, Toyama discloses said head pose corrector is further configured to map said three dimensional face surface model having an adjusted orientation to a two dimensional modified image (828, figure 8).

Regarding claim 15, Toyama discloses said two dimensional modified image is transmitted to a remote user (see e.g. figure 2).

Regarding claim 16, Toyama discloses said two dimensional modified image is presented to a local user (see e.g. figures 1 and 2).

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Regarding claim 17, Toyama discloses a video phone system (figures 1-2), comprising:  
a memory (104, figure 1) for storing an image containing at least a portion of a head of a human; and

a head pose corrector (102, figure 1) that

(i) estimates an orientation of said head in said image using a pattern recognition technique (810, figure 8);

(iii) computes a three dimensional model of a face surface of said human using a computer vision technique (822, 824, figure 8); and

(iv) adjusts an orientation of said three dimensional face surface model to provide a frontal view (826, figure 8).

Toyama does not appear to disclose that the image is kept unmodified when the orientation of the head is estimated to be frontal, as claimed. It appears that Toyama performs the computing and adjusting steps regardless of the orientation of the head.

Mariani discloses a facial direction estimation system. In particular, for a video conferencing environment, Mariani teaches that "[u]sing the face direction estimation ... it is possible to enhance the quality of the transmitted images by generating a frontal view when the face is off-frontal ... or by unchanging the current satisfying frontal face which is displayed" (column 3/34-40). Thus, Mariani, like Toyama, recognizes the need to adjust the orientation of the face in order to achieve eye-to-eye contact for video conferencing communications. Mariani further recognizes that when the original image of the face is a "satisfying frontal face" there is no need to change the orientation of the head, and the image can be left unchanged. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to

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modify Toyama by Mariani to achieve the claimed invention since Mariani teaches that when the orientation of the head is estimated to be front-facing, there is no need to modify the image of the face since it is already in the desired orientation.

Regarding claim 18, Toyama discloses said head pose corrector is further configured to use a symmetric face assumption to obtain a complete three dimensional face surface model for a profile view (824, figure 8).

Regarding claim 19, Toyama discloses said head pose corrector is further configured to employ a structure from motion technique to obtain said three dimensional face surface model (column 13/1-10).

Regarding claim 21, Toyama discloses said head pose corrector is further configured to map said three dimensional face surface model having an adjusted orientation to a two dimensional modified image (828, figure 8).

Regarding claim 22, Toyama discloses said two dimensional modified image is transmitted to a remote user (see e.g. figure 2).

Regarding claim 23, Toyama discloses said two dimensional modified image is presented to a local user (see e.g. figures 1 and 2).

***Contact Information***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN Q. LE whose telephone number is (571)272-7424. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian Q Le/  
Primary Examiner, Art Unit 2624

12/16/08